CLAIMS

What is claimed is:

1. A control system for controlling a motor of a winch, comprising:

a power supply;

a controller unit attached to said power supply;

a user operable control device for providing input signals to said controller unit;

a control circuit connected to said power supply and including four high current, non-mechanical electronic switches each of said electronic switches being operable between an open state and a closed state in response to respective control signals from said controller unit, a first two of said electronic switches being provided in parallel upstream of a motor field winding and a second two of said electronic switches being provided in parallel downstream of the motor field winding such that closing one of said first two of said electronic switches and one of said second two of said electronic switches causes current to flow through said motor field winding in a first direction while closing a second of said first two of said electronic switches and a second of said second two of said electronic switches causes current to flow through said motor field winding in a second direction opposite to said first direction.

2. The control system according to claim 1, wherein said electronic switches include MOSFET switches each controlled by low current control signals from said controller unit.

3. A fault detection system for a winch, comprising:

a spool;

a drive system drivingly connected to said spool and including a motor and a power source for providing current to said motor, said power source including a control circuit for controlling a direction of current supplied to a field coil of said motor;

a controller for determining a fault condition based upon feedback signals from said control circuit; and

a fault indicator responsive to said controller when said controller determines a fault condition.

4. The fault detection system according to claim 3, wherein said feedback signals are indicative of a thermal protection device condition.

5. The fault detection system according to claim 3, wherein said feedback signals are indicative of a battery voltage.

6. The fault detection system according to claim 3, wherein said feedback signals are indicative of a motor armature voltage.

7. The fault detection system according to claim 3, wherein said feedback signals are indicative of a circuit module temperature.

8. The fault detection system according to claim 3, wherein said feedback signals are indicative of a motor field voltage.

9. The fault detection system according to claim 3, wherein said fault indicator provides a plurality of different indicator codes indicative of different fault conditions.

10. An overload detection system for a winch, comprising:

a spool;

a drive system drivingly connected to said spool and including a motor and a power source for providing current to said motor, said power source including a control circuit including a plurality of switches for controlling a direction of current supplied to a field coil of said motor;

a controller for determining an overload condition based upon a voltage across one of said plurality of switches.

11. The overload detection system of claim 10, further comprising a temperature sensor for said one of said plurality of switches, said controller determining said overload condition based upon said voltage adjusted based upon a temperature of said one of said plurality of switches.

12. The overload detection system of claim 10, further comprising a low pass filter for removing noise from a voltage signal across said one of said plurality of switches.

13. A method of programming a controller capable of use for multiple types of winches, comprising the steps of:

activating a program mode of a controller; and

providing a programming voltage to said controller indicative of a type of winch the controller is installed in.

14. A method of programming an over-load interrupt function for a winch controller, comprising the steps of:

activating a programming mode for the winch controller;

attaching a load to the winch;

turning the winch on until the winch achieves a desired load and turning the winch off when the desired load is achieved;

sensing a voltage drop across a switch of said winch when said winch is turned off; and

setting a voltage set point to said sensed voltage drop.

15. A method of programming an over-load interrupt function for a winch controller, comprising the steps of:

activating a programming mode for the winch controller;

providing a predetermined voltage to said controller indicative of a desired set point voltage corresponding to a desired over-load limit.